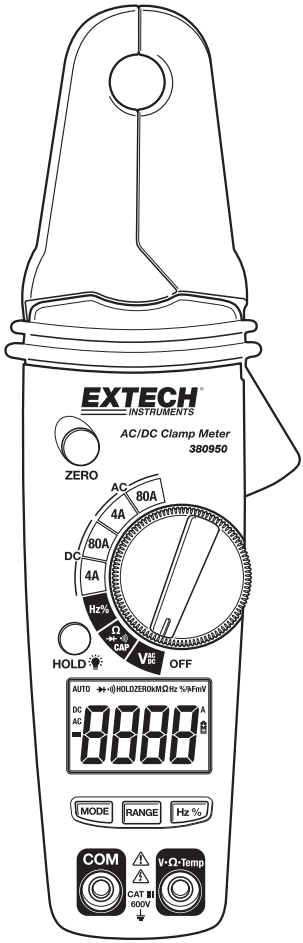
**User's Guide**

EXTECH INSTRUMENTS

# Model 380950
# 80A Mini AC/DC Clamp Meter



## *Introduction*

Congratulations on your purchase of the Extech 80A Mini AC/DC Clamp Meter. The Model 380950 measures AC/DC Current, AC/DC Voltage, Resistance, Frequency, Capacitance, Duty Cycle, Diode Test, and Continuity. This clamp meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

## *Safety*

### International Safety Symbols

This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.

This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present

Double insulation

### SAFETY NOTES

- Do not exceed the maximum allowable input range of any function.
- Do not apply voltage to meter when resistance function is selected.
- Set the function switch OFF when the meter is not in use.
- Remove the battery if meter is to be stored for longer than 60 days.

### WARNINGS

- Set function switch to the appropriate position before measuring.
- When measuring volts do not switch to current/resistance modes.
- Do not measure current on a circuit whose voltage exceeds 240V.
- When changing ranges always disconnect the test leads from the circuit under test.

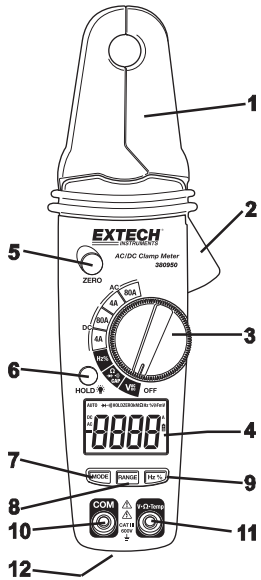
### CAUTIONS

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the test leads before replacing the battery or fuses.
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter. Repair or replace any damage before use.
- Use great care when making measurements if the voltages are greater than 25VAC rms or 35VDC. These voltages are considered a shock hazard.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- Voltage checks on electrical outlets can be difficult and misleading because of the uncertainty of connection to the recessed electrical contacts. Other means should be used to ensure that the terminals are not "live".
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

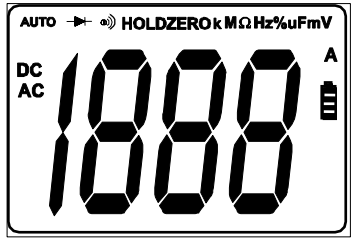
| Function | Maximum Input |
|---|---|
| A AC, A DC | 80A DC/AC |
| V DC, V AC | 600V DC/AC |
| Resistance, Frequency, Diode Test | 250V DC/AC |

## *Meter Description*

1. Conductor jaws
2. Jaw opening trigger
3. Function select switch
4. LCD Display
5. ZERO button
6. Data Hold and Backlight Button
7. Mode select button
8. Range select button
9. Hz/%/Duty Cycle button
10. COM input jack
11. V/Ω/Hz jack
12. Battery cover (rear)




| | |
|---|---|
| **AC** | AC (alternating current) |
| **DC** | DC (direct currrent) |
| ▬ | Minus sign |
| **AUTO** | AutoRange mode |
| **ZERO** | ZERO mode |
| •))) | Audible Continuity |
| **HOLD** | Data Hold mode |
| | Low Battery icon |
| | Diode test mode |
| **m** | milli |
| **V** | Volts |
| **A** | Amps |
| **K** | kilo |
| **M** | Mega |
| **Ω** | Ohms |

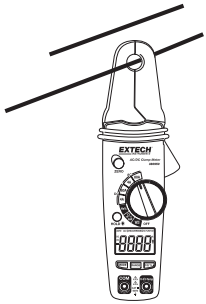


# *Operation*

**Notice**: Read and understand all **WARNING** and **CAUTION** statements listed in the safety section of this operation manual prior to using this meter. Set the function select switch to the OFF position when the meter is not in use.

**DC/AC Current Measurements**

**Warning:** Disconnect the test leads from the meter before making current clamp measurements.




1. Set the Function switch to the **80ADC, 4ADC, 80AAC or 4AAC** range. If the range of the measured is not known, select the higher range first then move to the lower range if necessary.
2. For DC current measurement, press the ZERO key to null the meter display.
3. Press the trigger to open jaw. Fully enclose one conductor to be measured.
4. The clamp meter LCD will display the reading.

**DC/AC Voltage Measurements**

1. Set the rotary function switch to the **V** position.
2. Insert the black test lead banana plug into the negative (COM) jack Insert the red test lead banana plug into the positive (V/Ω/Hz) jack
3. Select AC or DC with the **MODE** button
4. Connect the test leads to the circuit under test
5. Read the voltage on the display. The display will indicate the proper decimal point and value.

**Resistance Measurements**

1. Set the function switch to the Ω ▶| •))) **CAP** position.
2. Insert the black test lead banana plug into the negative (COM) jack Insert the red test lead banana plug into the positive (VΩ Hz) jack.
3. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance on the display. The display will indicate the proper decimal point and value.

**Continuity Check**

1. Set the function switch to the Ω ▶| •))) **CAP** position.
2. Push the mode button to indicate **•)))** on the display.
3. Insert the black lead banana plug into the negative (COM) jack Insert the red test lead banana plug into the positive (VΩ Hz) jack.
4. Touch the test probe tips to the circuit or wire you wish to check.
5. If the resistance is less than approximately 150Ω, the audible signal will sound. If the circuit is open, the display will indicate “OL.”.

**Diode Test**

1. Turn the rotary switch to the **Ω ⊣◀ •))) CAP** position.
2. Insert the black test lead banana plug into the negative (COM) jack
   Insert the red test lead banana plug into the positive (VΩ Hz) jack.
3. Push the mode button to indicate ⊣◀ on the display.
4. Touch the test probes to the diode under test. Typically for a normal diode, forward voltage will indicate 0.4V to 0.7V. Reverse voltage will indicate "OL". Shorted devices will indicate near 0V and an open device will indicate "OL" in both polarities.

**Capacitance Measurements**

**Warning**: To avoid electrical shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

1. Set the function switch to the **Ω ⊣◀ •))) CAP** position.
2. Push the mode button to indicate **nF** on the display.
3. Insert the black lead banana plug into the negative (COM) jack
   Insert the red test lead banana plug into the positive (VΩHz) jack.
4. Press the ZERO key to null the meter display.
5. Touch the test probe tips to the capacitor you wish to check.
6. Read the capacitance value on the display.

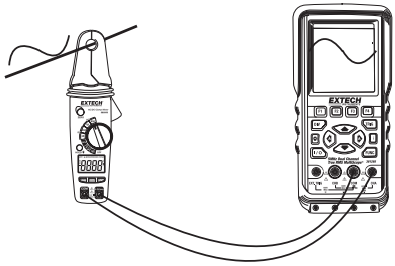
**Frequency or % Duty Cycle Measurements**

1. Turn the rotary switch to the **Hz %** position.
2. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (VΩ Hz ) jack.
3. Select Hz or % with the **HZ/%** button.
4. Touch the test probe tips to the circuit under test.
5. Read the frequency on the display.

**Analog Signal Output**

1. Turn the rotary switch to the **DCA** or **ACA** ranges.
2. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (VΩ Hz) jack.
3. Connect the test leads to a multimeter, oscilloscope or chart recorder inputs.
4. Press the trigger to open the jaw. Fully enclose the conductor to be measured.
5. The analog voltage signal is output to the measuring device.

**Note:** When measuring DCA, the output signal is DCV. When measuring ACA, the output signal is both ACV and DCV.



**Auto/Manual Ranging**

The meter turns on in Autoranging mode. Press the **RANGE** button to enter manual ranging. Each press of the range button will step to the next range as indicated by the units and decimal point location. Press and hold the **RANGE** button for two seconds to return to Autoranging mode.

**Note**: Manual ranging does not function in AC Current or Diode and Continuity check functions. In Temperature function, it will change the resolution from 0.1° to 1°.

**Data Hold**

To freeze the LCD meter reading, press the **HOLD** button. While data hold is active, the **HOLD** display icon appears on the LCD. Press the HOLD button again to return to normal operation.

**Backlight**

Press and hold the **HOLD** button for >2 seconds to turn the backlight on/off.

**Note:** The HOLD feature will activate when the backlight is turned on. Press the HOLD button again to exit the Hold feature.

**Zero Button**

Zeros Capacitance and DC Current measurements. Also allows the user to offset the meter by using the displayed value as the zero reference value. Press the ZERO key momentarily to activate and to exit Zero mode.

## *Specifications*

| Function | Range & Resolution | Accuracy (of reading) |
|---|---|---|
| DC Current | 4.000 ADC | ± (2.8% + 10 digits) |
| | 80.0 ADC | ± (3.0% + 8 digits) |
| AC Current (50/60Hz) | 4.000 AAC | ± (3.0% + 10 digits) |
| | 80.0 AAC | ± (3.0% + 8 digits) |
| DC Voltage | 400.0mV | ± (1.0% + 15 digits) |
| | 4.000V | ± (1.0% + 3 digits) |
| | 40.00V | ± (1.5% + 3 digits) |
| | 400.0V | |
| | 600V | ± (2.0% + 3 digits) |
| AC Voltage (50/60Hz) | 400.0mV | ± (1.0% + 30 digits) |
| | 4.000V | ± (2.0% + 5 digits) |
| | 40.00V | |
| | 400.0V | |
| | 600V | |
| Resistance | 400.0Ω | ± (1.0% + 4 digits) |
| | 4.000kΩ | ± (1.5% + 2 digits) |
| | 40.00kΩ | |
| | 400.0kΩ | |
| | 4.000 MΩ | ± (2.5% + 3 digits) |
| | 40.00MΩ | ± (3.5% + 5 digits) |
| Capacitance | 40.00nF | ± (5% + 30 digits) |
| | 400.0nF | ± (3% + 5 digits) |
| | 4.000µF | ± (3.5% + 5 digits) |
| | 40.00µF | |
| | 100.0µF | ± (5% + 5 digits) |
| Frequency | 5.000Hz | ± (1.5% + 5 digits) |
| | 50.00Hz | ± (1.2% + 2 digits)<br>Sensitivity: 10Vrms min. |
| | 500.0Hz | |
| | 5.000KHz | |
| | 50.00KHz | |
| | 500.0KHz | |
| | 5.000MHz | |
| | 10.00MHz | |
| Duty Cycle | 0.5% to 99.0% | ± (1.2% + 2 digits) |
| | Pulse Width: 100µs-100ms, Frequency: 5Hz to 150KHz | |
| Analog Output (ACA & DCA ranges) | 10mV/Amp ; Accuracy: ± (5%rdg + 2mV);<br>Output impedance: approx 3kΩ | |

| | |
|---|---|
| **Jaw size** | 0.5" (12.7mm) approx. |
| **Display** | 4000 count LCD |
| **Continuity** | Audible tone < 150Ω approx. |
| **Diode Test** | Open circuit voltage < 1.5VDC; Test current <1mA (typical) |
| **AC V bandwidth** | 50Hz to 400Hz |
| **AC A bandwidth** | 50/60Hz |
| **Low battery indication** | "🔋" is displayed |
| **Overrange indication** | "OL" is displayed |
| **Auto Power OFF** | After 25 minutes |
| **Measurement rate** | 2 per second, nominal |
| **Input Impedance** | 7.8MΩ (V DC and V AC) |
| **Operating Temperature** | 14ºF to 122ºF (-10ºC to 50ºC) |
| **Storage Temperature** | -22°F to 140°F (-30°C to 60°C) |
| **Operating Humidity** | Max 80% up to 87ºF (31ºC) decreasing linearly to 50% at 113ºF(45ºC) |
| **Storage Humidity** | <80% |
| **Operating Altitude** | 6560ft. (2000meters) operating |
| **Batteries** | (2) 1.5V AAA batteries |
| **Weight** | 0.44lb (200g) |
| **Size** | 7.87" x 1.97" x 1.38" (200x50x35mm) |
| **Safety** | For indoor use and in accordance with the requirements for double insulation to IEC1010-1 (1995): EN61010-1 (1995) Overvoltage Category III, Pollution Degree 2. |

**PER IEC1010 OVERVOLTAGE INSTALLATION CATEGORIES**

*OVERVOLTAGE CATEGORY I*

Equipment of OVERVOLTAGE CATEGORY I is equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level.
Note – Examples include protected electronic circuits.

*OVERVOLTAGE CATEGORY II*

Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation.
Note – Examples include household, office, and laboratory appliances.

*OVERVOLTAGE CATEGORY III*

Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.
Note – Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.

*OVERVOLTAGE CATEGORY IV*

Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation.
Note – Examples include electricity meters and primary over-current protection equipment

## Maintenance

**WARNING:** To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input terminals and turn OFF the meter before opening the case. Do not operate with open case.

**Cleaning and Storage**

Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for periods of longer than 60 days, remove the batteries and store them separately

**Battery Replacement**

1. Remove the two rear battery cover Phillips head screws
2. Open the battery compartment
3. Replace the two 1.5V AAA batteries.
4. Re-assemble the meter

## Warranty

***EXTECH INSTRUMENTS CORPORATION*** *warrants this instrument to be free of defects in parts and workmanship for* ***one year*** *from date of shipment (a six month limited warranty applies to sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website www.extech.com for contact information. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.*

## Calibration and Repair Services

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Care Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.


☎

**Support line (781) 890-7440**

Technical Support: Extension 200; E-mail: support@extech.com

Repair & Returns: Extension 210; E-mail: repair@extech.com


**Product specifications subject to change without notice**

For the latest version of this User's Guide, Software updates, and other up-to-the-minute product information, visit our website: www.extech.com


Extech Instruments Corporation, 285 Bear Hill Rd., Waltham, MA 02451



**Copyright © 2007 Extech Instruments Corporation**

All rights reserved including the right of reproduction in whole or in part in any form.